

Department of Computer Science
Semester Assignment Spring 2020

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Class & Semester: 8th Semester (Sec A)

Subject: Object Oriented Programming

Q1. What is Class and role of object in a Class, explain in detail with the help of a suitable program?

Answer 1:

Class:

A class may be defined as the blueprint for the data. A Class does not depict the data but it is actually a template for the data, which have some important things to include. I.e. The name of the class and what operations that class can performed on the objects.

Defining a Class inside a Program.

It starts with the key word **CLASS** followed by the class name and body of the class enclosed in the curly braces followed by semi-colon or a list of declarations.

For Example: The **Class syntax** is given as under.

```
class <class_name> {  
    field;  
    method;  
}
```

Object:

An object may be defined as an instance of a class which occupies a memory of a computer system. It is nothing but a self-contained component which consist of a methods and properties to make particular type of data useful. For example.

Color name, table, name, barking

When we send a message to an object, we are asking to invoke or execute one of its methods defined in the class.

On Programing side an object has, data structure, a function or a variable. It has some memory allocated to it. The object is designed as class hierarchies.

Syntax of an object is given as under.

```
ClassName ReferenceVariable = new ClassName();
```

Program to explain the Answer:

```
// Class Declaration
public class Dog {
    // Instance Variables
    String breed;
    String size;
    int age;
    String color;

    // method 1
    public String getInfo() {
        return ("Breed is: "+breed+" Size is:"+size+" Age is:"+age+" color is: "+color);
    }

    public static void main(String[] args) {
        Dog maltese = new Dog();
        maltese.breed="Rottweiler";
        maltese.size="Larg";
        maltese.age=12;
        maltese.color="Black";
        System.out.println(maltese.getInfo());
    }
}
```

Output of the Program:

Breed is: Rottweiler Size is:Larg Age is:12 color is: Black

Q2. Write a program about table printing which takes input from the user on the basis of OOP and explain in detail.

```

#include<iostream> // Header File for input out put
#include<conio.h> // Header file for console input out put
using namespace std;
class Table // The Class name
{
private: // Private data members of the class
    int Tabel_len, Table_num;
public: // public member function
    void set_num (int tab) // Function for the Table Number
    {
        Table_num = tab;
    }

    void set_len (int length) // Function for the Table Length
    {
        Tabel_len = length;
    }
    void display_tab () // Function to display the table out put
    {
        cout << "The table of " << Table_num << "\n" << endl;
        for (int i = 1; i <= Tabel_len; i++)
            cout << Table_num << "*" << i << "=" << Table_num * i << endl;
    }
};

int
main () // The main function where the execution of the program starts
{
    Table bob;
    int n, l;
    cout << "Please enter a number to display its Table\n";
    cin >> n;
    cout << "Please enter a number, which specify the length of table\n";
    cin >> l;
    bob.set_num (n);
    bob.set_len (l);
    bob.display_tab ();
}

```

```
    getch ();  
    return 0;  
}
```

The output is given as under:

```
Please enter a number to display its Table  
8  
Please enter a number, which specify the length of table  
9  
The table of 8  
  
8*1=8  
8*2=16  
8*3=24  
8*4=32  
8*5=40  
8*6=48  
8*7=56  
8*8=64  
8*9=72  
  
...Program finished with exit code 0  
Press ENTER to exit console.□
```

Q3. Write a program about any 2 cars which can calculate the performance of both of them and explain in detail.

```
public class car_Performance {  
    public static void main(String[] args) {  
        // TODO Auto-generated method stub  
        //System.out.println("Hi");  
        car Bugatti_Veyron= new car();  
        car McLarenP1= new car();  
        Bugatti_Veyron.cs=370;  
        Bugatti_Veyron.ts=370;  
        Bugatti_Veyron.br=9.6;  
        McLarenP1.cs=430;  
        McLarenP1.fc=30;  
        McLarenP1.br=10;
```

```

        System.out.println("Accelerating Speed of Bugatti_Veyron = "
+Bugatti_Veyron.cs + "mph");
        System.out.println("Accelerating Speed = " +Bugatti_Veyron.ts + "mph");
        System.out.println("Accelerating Speed of McLarenP1 = " +McLarenP1.cs +
"mph");
        System.out.println("Fuel Capacity = " +McLarenP1.fc + "gallons");
        System.out.println("First Method ");
        McLarenP1.perf();
        System.out.println("2nd Method "+Bugatti_Veyron.perfo());
    }
}

class car
{
int cs;
int ts;
double fc;
double br;
void perf() {
    double p;
    p=cs/br;
    System.out.println("Performance of the Car Bugatti_Veyron = " +p );
}

double perfo() {
    double p;
    p=cs/br;
    System.out.println("Performance of the McLarenP1 = " +p );
    return p;
}
}

```

Out Put of the Program

Result

```
$javac car_Performance.java
$java -Xmx128M -Xms16M car_Performance
Accelerating Speed of Bugatti_Veyron = 370mph
Accelerating Speed = 370mph
Accelerating Speed of McLarenP1 = 430mph
Fuel Capacity = 30.0gallons
First Method
Performance of the Car Bugatti_Veyron = 43.0
Performance of the McLarenP1 = 38.54166666666667
2nd Method 38.54166666666667
```